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(54) ULTRAVIOLET-CURABLE CATIONIC ELECTRODEPOSITION COATING COMPOSITION SUITABLE FOR PLATED MATERIAL

PURPOSE: To obtain an electrodeposition coating composition which is applicable to not only ordinary metals but also plated plastic or die-cast-metal articles, is rich in adhesion and flexibility, and imparts excellent anticorrosion by incorporating a polyfunctional acrylate and a specific resin capable of undergoing cationic electrodeposition as the active ingredients CONSTITUTION: This composition contains, as the active ingredients, 10-70, excluding 70, pts.wt. polyfunctional acrylate having three or more acryloyl groups per molecule and 30-90, excluding 90, pts.wt. resin which is capable of being cationically electrodeposited and has an average mol.wt. of 2,000-30,000. The resin is a copolymer of 1-20, excluding 20, pts.wt. vinyl monomer having a tertiary amino group and 80-99, excluding 99, pts.wt. at least one member selected from among hydroxyesters of α,β-unsaturated ethylenic monocarboxylic acids, alkyl esters of  $\alpha,\beta$ -unsaturated ethylenic monocarboxylic acids, and  $\alpha,\beta$ -unsaturated ethylenic compounds.

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#### CLAIMS

### [Claim(s)]

[Claim 1] The ultraviolet curing mold cation electrodeposition paint constituent suitable for the plating material characterized by containing under 90 weight sections for the resin of the average molecular weight 2,000-30,000 which has cation electrodeposition nature for the polyfunctional acrylate which has three or more acryloyl radicals in a molecule under 70 weight sections more than 10 weight sections as an active principle more than 30 weight sections. [Claim 2] The resin which has said cation electrodeposition nature following (a) more than 1 weight section Under 20 weight sections Or (b-2) (b-3) it is a copolymerization object more than the under 99 weight sections 80 weight section about one sort or two sorts or more of mixture. the following (b-1) — The ultraviolet curing mold cation electrodeposition paint constituent suitable for the plating material according to claim 1 characterized by for the average molecular weight being 3,000-30,000, and being resin which has the 3rd class amino group in the side chain of the copolymerization object.

(a) The 3rd class amino-group content vinyl monomer (b-1) alpha, beta-ethylene nature partial saturation monocarboxylic acid hydroxy ester (b-2) alpha, beta-ethylene nature partial saturation monocarboxylic acid alkyl ester (b-3) alpha, beta-ethylene nature unsaturated compound [claim

3] The resin which has said cation electrodeposition nature is [Formula 1] in a polymer.

– N – R

However, R is an ultraviolet curing mold cation electrodeposition paint constituent suitable for the plating material according to claim 1 characterized by being polyurethane of the average molecular weight 2,000-10,000 containing the 3rd class amino group shown by the with a carbon number of four or less alkyl group.

[Claim 4] Said electrodeposition paint constituent is an ultraviolet curing mold cation electrodeposition paint constituent suitable for claim 1 characterized by including a coating, pigments, or those mixture below 20 weight sections thru/or a plating material given in three if needed.

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#### DETAILED DESCRIPTION

[Detailed Description of the Invention]

demonstrates, cause statement and body and the problem that is an abign as the problem that this Supplies Department gate. 
[2003]
[Problemto to be Solved by this invendon) However, since the paint film used with said 
conventional technique is thermosetting, curing temperature has the problem that is as high as 
100 degrees of or ence, and cannot use for that to materials, cuch as weak plastices. 
[2006] Although there is the expressed of using point for ultraviolet curing and attitening by UV 
tradiction in order to solve this, this conclete of ultraviolet review hardshift or Egermer: a 
nonconer, a photopolymenization initiator, a concitizor, sto., and is called the high solid and the 
nomenivent modification of the bod influence to the body by monomor scottoring at the time 
of paint. Mergayer, the paint film obtained from this type of coating has the problem that it is 
work and delivation with a base material is also but gift though the thing of a high degree of 
hardness is obtained. On a smooth base meterial, this point is a problem especially like a plating 
coat.

cost. [0007] The suppose of this invention is offering the electrodeposition pains constituent which can apply not only to a common metal but to the pixting product made from plastice or disc easting, and is rich in advesion and flexibility, and gives the outstanding anti-corrociveness, and transparency, gloss and a variabled color variation.

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#### JP.05-268026.A [DETAILED DESCRIPTION]

2/8 14-12

sort or two cores or more of mixture, and the everyse malacule is 3,000-30,000, and or (b-2) (b-3) makes it indispensable to have the 3rd class entire group in the side chain of the

sort or two corts or move of mature, and the average melecule is 3,000-30,000, and or is -2) (the 3) makes it hotispensible to have the 3rd dates arising you in the side chain of the coopymerization object.

[0.17] (a) The 3rd class aminor-group cortest, vinyl monomer, for exemple, (meta), corylioracid dimethyl aminorarity, Acrylio-acid dimethyl acrylio-acid systems, acrylio-acid (meta) acrylio-acid hydroxysty, acrylio-acid (meta) acrylio-acid hydroxysty, acrylio-acid (meta) hydroxysty, acrylio-acid (meta) acrylio-acid hydroxysty, acrylio-acid (meta) acrylio-acid (meta)

section preferably. If many [ see ] since the voter absorption of a paint film will interacte, it is not desirable.

(D013) alpha [ of (b-2) ] and beta-citylene nature period soluration monocarboxyllo acid alkyl sater to used the making the flexibility of a paint film, flow nature, etc., give purpose, and beginge can be chosen in the large range if needed.

(D020) alpha of (b-2) and beta-subviene nature unsulurated compound are used if needed as a modifier of assistance of frequentment in physical preparties, such as the water restring property of a paint film, and chemical resistance, and if a of a paint film. When many [ too ], in order to increase the britishness of a paint film, ow eight sections are limits.

(D021) A well-known radical solumerization method is expliced as the applymentization approach. That is, it is to obtained by the solution polymentization varies a subside solvent, for example, a methenol, athonol, isopropyl stochal, methyl collosolve, surylectiosolve, butyl collosolve, butyl collosolve assists, tolkiene, a sylent, cto.

(D022) As a polymerization hidistor. 2 and 2-acetal solutyl nitrit, 2, and 2-acetalis (2,4-dimetrylealerositrist), a hency operation operation as mentioned.

(D023) The obtained copolymer matrializes the baciety and gives water-dispersion (i received for eleptrodeposition). As an exil required for neutralization, interpain exists, such as a require acid, a propingly exils and a nocalize acid, formic acid, a propingly exils and a local solution of a significant or in a subtime of collections which are observed which were added to the side chain give adversion with a substrate phone rout from incide.

(D023) The region which has outlon electrodeposition nature — the above (a) and (b-1) — In or (b-2) (b-2), when a copolymerization object with one serie or two sorts or mark of first time is companion. When allowed the propertical phone propagated by choosing a suitable twing from incide.

needed by choosing a suitable tieng from inside. [0025] Moreover, the resin which has cation electrodeposition nature is [0026].

JP.05-262026 A (DETAILED DESCRIPTION)

[0000]
[Means for Solving the Problem] This invention is an otherwisels carried mold caden observed position paint constituent satisfate for the plating material characterized by containing under 30 weight accident for the resin of the severage melastice weight 2000-0,000 which has cation electrodeposition nature for the polyfunctional ecrystace which has three or more acryloryl radicals in a melastic world recommend to the polyfunctional ecrystace which has three or more acryloryl radicals in a melastic world recommend to the polyfunctional ecrystace which has three or more acryloryl radicals in a melastic enter 70 weight sections as an earlier principle more than 30 weight excitons and the following [0009] ecrywater, the recin with which this invention has said action electrodeposition nature — the following (b-1) — it is a construction educate of every the condex 99 weight sections 60 weight (b-1) — it is a construction object of the construction object. [0010] (a) For the 2rd class aminor group in the cide chain of the copolymentation object. [0010] (a) For the 2rd class aminor group content visual reasonance (b-1) alpha, beta-retrylone makine partial acturation monocarbospija acid albyl extent (b-2) objects, beta-retrylone makine partial acturation monocarbospija acid albyl extent (b-1) alpha, beta-retrylone makine partial acturation monocarbospija acid albyl extent (b-2) objects. [0010] in a polymer. [Formula 2]

(0012) However, R is characterized by being polymethens of the everage molecular weight. 2,000–10,000 containing the 3rd class smine group shown by the with a carbon number of fa

[0013] Moreover, this invention is characterized by said electrodeposition paint contributes containing a coeting planents, or those mixture below 20 weight sections if needed, [0014]

containing a coeking, plaments, or those mixture below 20 weight sections if needed.

[2014]

[Function] If this invention is followed, it will consider as the ective principle which has 10 - 70 is of the weight of psylyte which has three or more scrybyl redicals which the radical solymerization rescrice by utherwheter reapy produces, and 00 - 20 is of the weight of resh which has sotton electrodeposition nature. When the resh which has ention electrodeposition nature, when the resh which has ention electrodeposition nature. When the resh which has ention electrodeposition nature is closificated by the coated object, carylate sextle, a peak film is formed, and by utherwheter rest in the resh of the resh in the produced at a polymerization and hardens. Since on anyloyl radical is in server as the three-dimensional solutions, and the paint film produced at a polymerization reserver as the three-dimensional solutions between a processing processing can be reform using uthrafolet rays as a method of hardealing those paint films, without mixing the temperature of a costed object, it can apply be the plastical exists produced made from ABS can of there is no possibility that butting stor. That planting or of the many firms and the temperature of a costed object, it can apply be the planting or of the removerable of the dealing three produces made from ABS coating. Since it can hattermore be for character cannot always in the produce made from ABS coating. Since it can hattermore be for character and there is no possibility that butting store part is not be absoluted from the coating. Since it can hattermore be for character and the produce made from ABS coating. Since it can hattermore be for character and there is no possibility that butting store the coating since it can be carried from the coating since it can be carried from the coating since it can be carried from the coating since it can be carried as the coating and the coating since it can be calso as the coating of the mixed produces and the dealer of the co

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JP.05-263028A (DETAGLED DESCRIPTION)

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[0027] However, R may be polyurathene of the molecular weight 2,000-10,000 containing the 2rd class smike group. Chem by the with a corbon number of four or less alloyl group. Constrainty, elithreath polyurathran is compounded at the resociate of divident alcohol (dict) and divident isopropriate (discognated), in order to introduce sold the 3rd class amino proce, is becomes an independent certainty in the other the 3rd class amino add of (or 1) has for example. Nemothylifetherestanise, Nemot

man a commencers membed in two covers when acces not have access any experient, auton as extended to the control of the contro

ultravioles ouring mole cases. description of this invention will be lost.

(0035) [0036] [Example] Hereafter, although it explains more concretely that this invention is seen at an

JP.05-263026.A [DETAILED DESCRIPTION]

example, this invention is not limited to this.	
[0039] Example 1 (1-A) exitator, a condensator, a thermometer, and a tap funnel in the 4	opening
flesh with which each opening was equipped Tolima (congressions) 200g of hexamothylene	di
isocretete. Dibauti nutin AIRAU rate 0.48g which has a catalysis in sarylio-anid-2-hydrox	yethyl
116z while teaching and egitating sytene 135g. The mixed liquor which added METOKINOS	10.1E
as a polymerization agent was dropped at uniform velocity for 10 minutes from the top fu	onel.
charming was continued for 50 minutes, holding at 40 more degrees. C or less, and the acr	vite
solution made into the purpose was obtained in addition, when absorption of 2270cm=1	
dissuppared with the infrared absorption spectrum, it checked that the isogyanate radios	had
reacted completely.	004
[0040] (a) dimethylaminosthyl methecrylete 40g, reethopyllo-acid (b=1)=2-hydroxyethyl 1	GUE,

disappeared with the Infrared absorption spectrum, it charked that the Isooyanabe radical had reacted completely.

[DMD] (a) dimethybranionathyl methacutate 40g, nethacylis—sold (b-1)-2-hydroxystep) 100g, and acylicradi (b-2)-2-subvibusyl 90g (1-9) 50g of n-butyl methacyliste, 145g all methyl reathacylistes, and supremised (b-2)-2-subvibusyl 90g (1-9) 50g of n-butyl methacyliste, 145g all methyl reathacylistes, and supremised the interest of the physical sold of the physical sold interest as a polymerication interiest The mixed (inpur which added 10g for 2 and 2-authot Isobutyl rithing as a polymerication interiest The mixed (inpur which added 10g for 2 and 2-authot Isobutyl rithing is application of the special sold interest and account of the mixed figure of the still mixed form of the still mixed flow of the

the members was observed, having used the union quartity as 11, agusting on accounting were (3-m). [0045] After R carried out electropainting of the ultraviolat curing mold cartion electropagnesition paths constituent obtained in said examples 1-3 to the text piece (Snonutinen), which performed rickel plating to ABS election by 10 micromotors of blockness by the expension used commentionably and 80 degrees 0 died for 10 minutes, ultraviolet rays were tradicated for 2 commentionably and 80 degrees 0 died for 10 minutes, ultraviolet rays were tradicated for 2 comments of 20cm with the LIV oven (60% high pressure mercury vapor famp) by the eye graphic company. [0046] which shows the result of an evaluation bits of the completed platf film in Table 1 with the result of the example of a comparison by this [Table 1]

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武殿坝	₽.	突放河1	実施例 2	虫纵似虫	比較例
9	12	0	0	C	Δ
唐 卷	性	100/100	100/100	100/100	0/100
æ	瓜	2 H	3 H	2 H	4 H
180° 街盘子	スト	Δ	٥	Ċ	×
CASST:	2bra	0	0	Ö	C
プセトン科・	bs	50~10	200+	200+	200÷
<b>谢济里水</b> :	5 bra	0_	O	0	Ċ
5 % NeON 4 8	244	部分白化	0	٥	Û
5% RE4	3 hrs	¢	0	0	0

[D047] The tast method is as follows.
[D048] Bosider it sees. It is based on viewing irregularity was accepted only for the example of a comparison for a white.
[D049] Adhesion Grose act adhesion test US X 5951 \*\*\* Whenever Microbish Pencil Uni 160 days folding test of 1kg loads 190 dayrees of took pieces are beat. A collophane tops in method to adhere to a fall A peed test. O mark exclusion rething, x mark complete avulsion. \*\*F merk partial — exclusion to the section of the section of the A the load is applied to the cloth immersed in the actions. A test piece top 1s made to reciprocate. Count of round trip beighted for an under the about the appearance after 5-hour immersion it is Judgment 5Nk0/46hrs by viewing it is visual judgment 5% suffurior-world 48hrs about the appearance after 46-hour immersion at 25 dayrees C to 50kN0/44 water sold store in the appearance of the count of rounding in the visual padgment 5% suffurior-world 48hrs about the appearance after 46-hour immersion at 25 dayrees C to 50kN0/44 water soldship in the unstitute analysis activities and the experience of the suffurior in the surface of the suffurior and visual padgment to the suffurior and visual activity and the appearance of the suffurior in the surface of the suffurior and the appearance of the suffurior of the su

[D000]
[Effect of the inventional it handens by knodbothing ultraviolet rays in andinary temperature concording to this invention as mentioned above, and a material and adhesion are good and the point firm substalls for the pisting product her the nati-controliveness and transparency which were rich and excellent in filestility, and made from good physics and the dies easting of an appearance can be obtained.

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